

IN THE CLAIMS:

Claims 1-8 (canceled).

Claim 9 (new): A catalyst for the preparation of a cyclopentenone ring from the reaction of carbon monoxide, an alkene-containing compound and an alkyne-containing compound, comprising:

a catalytically active component selected from the group consisting of a transition metal-containing carbonyl compound, a π -alkyne-transition metal-containing carbonyl complex and mixtures thereof;

a support; and

a linking group connecting the catalytically active component to the support,

wherein the alkyne that is part of the π -alkyne-transition metal-containing carbonyl complex is the same as the alkyne-containing compound or is readily displaced by the alkyne-containing compound.

Claim 10 (new): The catalyst of claim 9, wherein two transition metals, which can be the same or different, are present in each catalytically active component.

Claim 11 (new): The catalyst of claim 9 or claim 10, wherein each transition metal present in the catalytically active component is independently selected from the group consisting of cobalt, rhodium, iridium, tungsten, molybdenum, titanium, nickel, iron and ruthenium.

Claim 12 (new): The catalyst of claim 11, wherein each transition metal is cobalt.

Claim 13 (new): The catalyst of claim 9, wherein the support is a polymer or resin.

Claim 14 (new): The catalyst of claim 9, wherein the alkyne-containing compound and the alkene-containing compound are separate compounds.

Claim 15 (new): The catalyst of claim 9, wherein the alkyne-containing compound and the alkene-containing compound are the same compound.

Claim 16 (new): The catalyst of claim 9, wherein the linking group is selected from the group consisting of phosphines, phosphites and isonitriles.

Claim 17 (new): A process for the preparation of a cyclopentenone ring which comprises reacting carbon monoxide, an alkyne-containing compound and an alkene-containing compound in the presence of a catalyst, where the catalyst comprises:

a catalytically active component selected from the group consisting of a transition metal-containing carbonyl compound, a π -alkyne-transition metal-containing carbonyl complex and mixtures thereof;

a support; and

a linking group connecting the catalytically active component to the support,

wherein the alkyne that is part of the π -alkyne-transition metal-containing carbonyl complex is the same as the alkyne-containing compound or is readily displaced by the alkyne-containing compound.

Claim 18 (new): The process of claim 17, wherein two transition metals, which can be the same or different, are present in each catalytically active component.

Claim 19 (new): The process of claim 17, wherein the support is a polymer or resin.

Claim 20 (new): The process of claim 17, wherein the alkyne-containing compound and the alkene-containing compound are separate compounds.

Claim 21 (new): The process of claim 17, wherein the alkyne-containing compound and the alkene-containing compound are the same compound.

Claim 22 (new): The process of claim 17 or claim 18, wherein each transition metal present in the catalytically active component is independently selected from the group consisting of cobalt, rhodium, iridium, tungsten, molybdenum, titanium, nickel, iron and ruthenium.

Claim 23 (new): The process of claim 22, wherein each transition metal is cobalt..